

Electric Control Valves

Types 3260/5857, 3260/5824, 3260/5825, 3260/3374,
3260/3274, 3260/3375 and 3260/5757-7, 3260/5725-7

samson

Pneumatic Control Valves

Types 3260/2780, 3260/3372, 3260-1, 3260-7



Type 3260/5857
Type 3260/5757



Type 3260/5824
Type 3260/5724



Type 3260/3374



Type 3260/3274



Type 3260-1



Type 3260/2780-2



Type 3260/3372

Mounting and Operating Instructions

EB 5861 EN

Edition April 2014

Definition of signal words



DANGER!

Hazardous situations which, if not avoided, will result in death or serious injury



NOTICE

Property damage message or malfunction



WARNING!

Hazardous situations which, if not avoided, could result in death or serious injury



Note:

Additional information



Tip:

Recommended action

1	General safety instructions.....	5
2	Design and principle of operation	6
2.1	Technical data of Type 3260 Three-way Valve	8
2.2	Possible combinations (valve/actuator)	9
2.3	Permissible differential pressures	10
2.4	Nameplate	11
2.5	Customer inquiries	11
3	Installation	12
3.1	Mounting position	12
3.2	Strainers	13
3.3	Additional mounting instructions	13
4	Mounting, connecting and configuring the actuator.....	13
5	Attachment	14
5.1	Connection	15
5.2	Configuration	15
6	Dimensions and weights	16

1 General safety instructions

For your own safety, follow these instructions concerning the mounting, start up and operation of the control valve:

- The control valves must be mounted, started up or serviced by fully trained and qualified personnel only; the accepted industry codes and practices are to be observed. Make sure employees or third persons are not exposed to any danger. All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up and maintenance, must be strictly observed.
- To ensure appropriate use, only use the control valve in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the valve at the ordering stage. The manufacturer does not assume any responsibility for damage caused by external forces or any other external factors. Any hazards that could be caused in the valve by the process medium, the operating pressure and the signal pressure or by moving parts are to be prevented by means of appropriate measures.
- For installation and maintenance, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well. Depending on the field of application, allow the valve to cool down or heat up to reach ambient temperature before starting any work on it.
- The actuators are designed for use in low voltage installations. For wiring and maintenance, you are required to observe the relevant safety regulations.
- Take necessary measures to ensure that the power supply cannot be reconnected inadvertently.
- Take care while performing adjustment work on live parts. Never remove any covers!

To avoid damage to any equipment, the following also applies:

- Proper shipping and storage are assumed.



Note:

The control valves comply with the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. The declaration of conformity is available on request.

2 Design and principle of operation

Fig. 1

The three-way valve is primarily used as a mixing valve. The media to be mixed enter the valve at ports A and B. The combined flow exits the valve at port AB.

Flow-diverting valves are also available on request. The medium enters the valve at port AB and the partial flows exit at ports A and B.

The cross-sectional area of flow between the seat (2) and plug (3) is determined by the position of the plug stem (6). The plug is moved by changing the control signal applied to the actuator.

The valve (1) and actuator have a force-locking connection up to DN 50 and a form-fit connection for sizes DN 65 and larger.

Fail-safe action

For three-way valves mounted to an actuator with fail-safe action, the control valve has two different positions which become effective upon power supply failure:

Actuator stem extends

- Port B of the mixing valve closes upon power supply failure
- Port A of the diverting valve closes upon power supply failure

Actuator stem retracts

- Port A of the mixing valve closes upon power supply failure
- Port B of the diverting valve closes upon power supply failure

Electric actuators

The Types 5857, 5824, 5825, 3374 and 3375 Electric Actuators as well as the Type 3274 Electrohydraulic Actuator can be controlled using a three-stepping point signal. Except for Type 3375, all the actuators in the version with positioner can also be controlled using signals from 0/4 to 20 mA or 0/2 to 10 V. Various electrical accessories can be optionally installed.

Types 5825, 3274-21 and 3274-22 Actuators are able to perform a fail-safe action. Refer to Table 4.

Electric actuators with process controllers

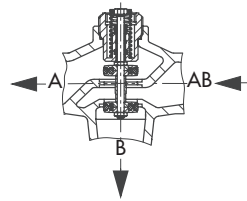
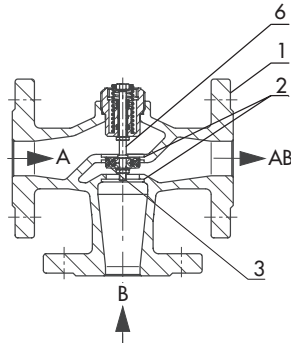
The actuator consists of a digital controller which is integrated into the electric actuator housing. The Types 5757-7 and 5725-7 Electric Actuators with Process Controllers are suited for heating and cooling applications.

Type 5725-7 Actuator is able to perform a fail-safe action. Refer to Table 4.

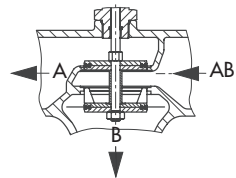
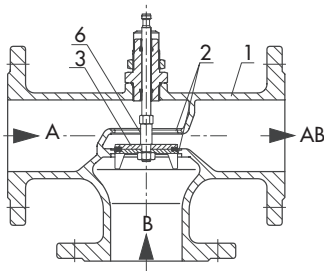
Pneumatic actuators

The Types 2780, 3271 and 3277 Pneumatic Actuators as well as the Type 3372 Electro-pneumatic Actuator work with various control signals. Types 2780, 3271 and 3277 Pneumatic Actuators require a supply pressure of at least 0.2 bar above the maximum bench range. A supply pressure of at least 3.7 bar is required for Type 3372. All actuators are available for fail-safe action "Actuator stem extends (FA)" or "Actuator stem retracts (FE)".

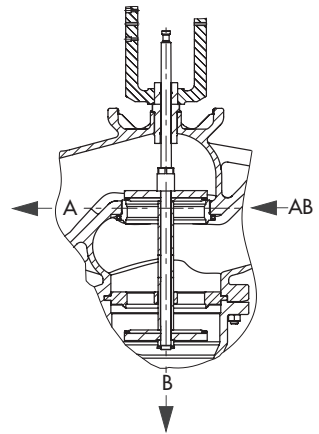
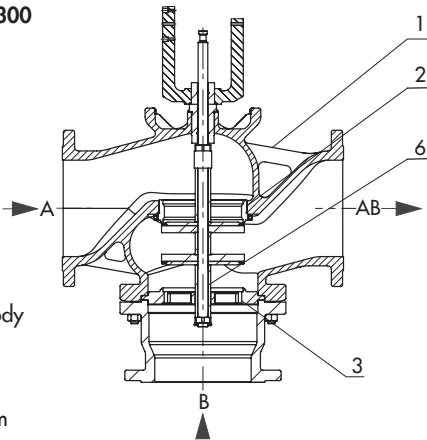
DN 15 to 50



DN 65 to 150



DN 200 to 300



- 1 Valve body
- 2 Seat
- 3 Plug
- 4 Plug stem

Fig. 1: Plug arrangement in mixing valves (left) and diverting valves (right)

2.1 Technical data of Type 3260 Three-way Valve

Table 1: Technical data

Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300
Nominal pressure	PN	16													
Permissible temperature range	°C	5 ¹⁾ to 150 ¹⁾													
Seat/plug sealing		Soft seal													
Rated travel	mm	6		12		15		30		60					
Mixing valve		•		•		•		•		•					
Diverting valve		•		•		•		•		•					
Leakage class according to IEC 60534-4		Class IV (≤ 0.01 % of K _{VS} coefficient)													

- ¹⁾ Use an intermediate insulating piece (1990-1712) for valves in DN 15 to 50 or (1991-4686) for valves in DN 65 to 150.
- for medium temperatures between –10 and +5 °C (actuators according to Table 4)
 - in networks with constant medium temperatures > 130 °C (Types 5725-7, 5824 and 5825 Actuators)
 - for liquids > 120 °C (Types 5757-7 and 5857 Actuators)

Table 2: Materials · Material numbers according to DIN EN

Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	
Valve body		Cast iron EN-JL1040 (GG-25)														
Seat		Cast iron EN-JL1040 (GG-25)												1.4006/1.0619		
Plug		Brass · CuZn37Pb												1.4404		
Plug stem		Stainless steel · 1.4305												1.4305		
Seat/plug sealing		EPDM (standard) · FPM (special version)														
Stem seal		EPDM seal ring														
	Special version for oils	FPM seal														
Yoke		—							See actuator				—			

Table 3: Nominal sizes, K_{VS} coefficients and seat diameters

Nominal size	DN	15			20	25	32	40	50	65	80	100	125	150	200	250	300
K_{VS} coefficient	1	1.6	2.5	4	6.3	10	16	25	40	60	80	160	250	320/ 250 ¹⁾	630	800	1200
Seat Ø	mm	16	16	16	16	20	24	32	40	40	70	70	100	130	130	207	276
Rated travel	mm	6	6	6	6	6	6	12	12	12	15	15	30	30	30	60	60

- ¹⁾ Direction of flow
- B → AB with maximum K_{VS} coefficient
 - A → AB with reduced K_{VS} coefficient

2.2 Possible combinations (valve/actuator)

Table 4: Possible combinations: Type 3260 Three-way Valve/actuator

Type	Fail-safe action: Actuator stem		Nominal size DN													
	extends	retracts	15	20	25	32	40	50	65	80	100	125	150	200	250	300
Electric actuators																
5857 ¹⁾	–	–	•	•	•											
5824-10 ²⁾	–	–	•	•	•											
5825-10 ²⁾	•	–	•	•	•											
5825-15 ²⁾	–	•	•	•	•											
5824-20 ²⁾	–	–				•	•	•								
5825-20 ²⁾	•	–				•	•	•								
5825-25 ²⁾	–	•				•	•	•								
5824-30 ^{2) 5)}	–	–							•	•						
3374-11	–	–							•	•						
3374-10	–	–							•	•	•	•	•			
3274-11 ³⁾	–	–							•	•	•	•	•			
3274-15 ³⁾	–	–							•	•	•	•	•			
3274-21 ³⁾	•	–							•	•	•	•	•			
3274-22 ³⁾	–	•							•	•	•	•	•			
3375-11 ⁴⁾	–	–													•	•
Electric actuators with process controllers for heating and cooling applications																
5757-7 ¹⁾	–	–	•	•	•											
5725-710	•	–	•	•	•											
5725-715	–	•	•	•	•											
5725-720	•	–				•	•	•								
5725-725	–	•				•	•	•								
Pneumatic actuators																
2780-1	•	•	•	•	•	•	•	•								
2780-2	•	•	•	•	•	•	•	•								

Type	Fail-safe action: Actuator stem		Nominal size DN													
	extends	retracts	15	20	25	32	40	50	65	80	100	125	150	200	250	300
3372	•	•	–						•	•	–					
3271 ³⁾	•	•	–						•	•	•	•	•	•	•	•
3277 ³⁾	•	•	–						•	•	•	•	•	–		

¹⁾ Type 3260 Three-way Valve in combination with this actuator as version with special spring

²⁾ Versions with half transit time on request

³⁾ Type 3260 Three-way Valve in combination with these actuators with rod-type yoke:

DN 65 to 80: Order no. 1890-8696; for Type 3271 with 240 cm² area additionally order no. 0250-1450

DN 100 to 150: Order no. 1400-8822

⁴⁾ DN 200 to 300: These valves do not need an extra rod-type yoke

⁵⁾ Type 3260 Three-way Valve in combination with this actuator with rod-type yoke: Order no. 1400-7414

2.3 Permissible differential pressures

All pressures stated in bar

Table 6: Electric Control Valves Type 3260/...

Type		5857 5757-7	5824/5825 5725-7	3374		3374	3375
				-11	-10	-11/-15/-21/-22	-11
DN	K _{VS} coefficients	Δp when p ₂ = 0 bar					
15	1 · 1.6 · 2.5 · 4	4	4	–	–	–	–
20	6.3	2.6	4	–	–	–	–
25	10	1.8	4	–	–	–	–
32	16	–	1.7	–	–	–	–
40	25	–	1.1	–	–	–	–
50	40	–	1.1	–	–	–	–
65	60	–	1.3 ¹⁾	4	4	4	–
80	80	–	1.3 ¹⁾	4	4	4	–
100	160	–	–	–	2.8	1.9	–
125	250	–	–	–	1.7	1.1	–
150	250/320 ²⁾	–	–	–	1.7	1.1	–
200	630	–	–	–	–	–	3.3
250	800	–	–	–	–	–	3.3
300	1200	–	–	–	–	–	1.8

¹⁾ Only with Type 5824-30 Electric Actuator

²⁾ Direction of flow B → AB with maximum K_{VS} coefficient · A → AB with reduced K_{VS} coefficient

Table 7: Pneumatic Control Valves Type 3260/...

Type		2780-1	2780-2	3372		3271 and 3277					3271		
Diaphragm area	cm ²	120	120	120	120	240	240	350	350	700	1000	1400-60	
Bench range	min. bar	0.4	0.4	1.4	2.1	0.4	0.6	0.4	0.6	0.4	0.8	1.0	1.1
	max. bar	1.0	2.0	2.3	3.3	2.0	3.0	2.0	3.0	2.0	2.8	3.2	2.4
Max. supply pressure	bar	1.4 ¹⁾	2.4 ¹⁾	4	5	2.5	3.7	2.5	3.7	2.4	4	4	4
DN	K _{VS} coefficients	Δp when $p_2 = 0$ bar											
15	1 · 1.6 · 2.5 · 4	4	4	–	–	–	–	–	–	–	–	–	–
20	6.3	4	4	–	–	–	–	–	–	–	–	–	–
25	10	4	4	–	–	–	–	–	–	–	–	–	–
32	16	1.7	1.7	–	–	–	–	–	–	–	–	–	–
40	25	1.1	1.1	–	–	–	–	–	–	–	–	–	–
50	40	1.1	1.1	–	–	–	–	–	–	–	–	–	–
65	60	–	–	3.8	4	1.9	3.1	3	4	–	–	–	–
80	80	–	–	3.8	4	1.9	3.1	3	4	–	–	–	–
100	160	–	–	–	–	–	–	–	–	3.1	–	–	–
125	250	–	–	–	–	–	–	–	–	1.8	–	–	–
150	250/320 ²⁾	–	–	–	–	–	–	–	–	1.8	–	–	–
200	630	–	–	–	–	–	–	–	–	–	2.2	3.0	4.0
250	800	–	–	–	–	–	–	–	–	–	2.2	3.0	4.0
300	1200	–	–	–	–	–	–	–	–	–	1.2	1.7	2.2

¹⁾ Only with spring-to-open, max. 4 bar with spring-to-close

²⁾ Direction of flow B → AB with maximum K_{VS} coefficient · A → AB with reduced K_{VS} coefficient

2.4 Nameplate

SAMSON		1
2		3
kvs 4	6	7
PN 5		

- 1 Type designation
- 2 Configuration ID (Var.-ID)
- 3 Date of manufacture
- 4 K_{VS} coefficient
- 5 Nominal pressure
- 6 Version
 - ↗ mixing valve ↖ diverting valve
- 7 Max. permissible temperature

2.5 Customer inquiries

Please submit the following details:

- Type designation
- Configuration ID (Var.-ID)
- Date of manufacture

3 Installation

3.1 Mounting position

- The control valves can be mounted in any position. However, the electric actuators must not be suspended downwards.
- The valves are supplied as either mixing or diverting valves. They can be used for both mixing as well as diverting service (Fig. 2). Make sure that the system-related arrangement of inlet and outlet located at the ports A, B and AB comply with the symbols on the body nameplate.



NOTICE

Install the valve free of stress and with the least amount of vibrations as possible.

Pipeline routing

To ensure the control valve functions properly, the pipeline must be designed to be straight and without any manifolds or disturbances for a distance of at least six times the pipe size (DN) upstream and downstream of the valve. Contact SAMSON if this length cannot be met during installation.

Clean out the pipeline thoroughly prior to installing the valve.

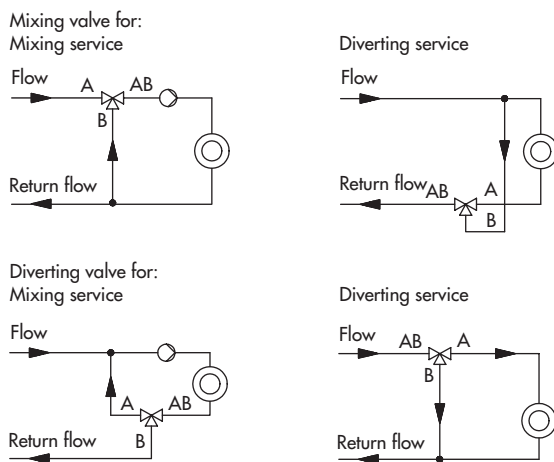


Fig. 2: Typical installations

- Choose a place of installation that allows you to freely access the control valve even after the entire plant has been completed.
- Thoroughly flush the pipelines prior to installation. Install a strainer (e.g. SAMSON Type 2 NI ► T 1015 EN) at the respective valve inlet to prevent any sealing parts, weld spatter and other impurities carried along by the process medium impairing the proper functioning of the valve, above all the tight shut-off.
- Make sure the valve body is installed free of stress. If necessary, support the pipelines near the connections.

3.2 Strainers

- Install the strainer upstream of the valve inlet. The direction of flow must correspond to the arrow on the body.
- The filter element must be installed to hang downwards.
- Remember to leave enough space to remove the filter element.

3.3 Additional mounting instructions

We recommend installing a hand-operated shut-off valve upstream of the strainer and downstream of the control valve to be able to shut down the plant for cleaning and maintenance, and when the plant is not used for longer periods of time.

4 Mounting, connecting and configuring the actuator



NOTICE

*The instructions on how to mount the valve onto the actuator, perform electrical or pneumatic connection as well as configure the actuator are described in detail in the mounting and operating instructions (EB) of the actuator. **Read the actuator's mounting and operating instructions!***

Associated actuator documentation

Electric actuators

Type 5857	► EB 5857 EN
Type 5824	► EB 5824-1 EN (version with three-stepping point signal) ► EB 5824-2 EN (version with positioner)
Type 5825	► EB 5824-1 EN (version with three-stepping point signal) ► EB 5824-2 EN (version with positioner)
Type 3374	► EB 8331-1 EN
Type 3274	► EB 8340 EN
Type 3375	–

Electric actuators with process controllers

Type 5757-7	► EB 5757-7 EN
Type 5725-7	► EB 5725-7 EN

Pneumatic actuators

Type 2780	► EB 5840 EN
Type 3271	► EB 8310 EN
Type 3277	► EB 8311 EN

5 Attachment



Note:

Three-way valves in sizes DN 65 and larger are protected by a protective cover on the neck of the valve. Remove this cover before mounting the valve. Before mounting the actuator, unscrew the hex nut (8).

The Types 3274, 3271 (240 to 700 cm²) and 3277 Actuators are mounted using the mounting parts listed in Table 8 according to the following description.

Mounting Type 3274 Actuator (Fig. 3)

1. Place yoke (9) on valve and fasten tight with hex nut (8) (min. 100 Nm).
2. Fasten adapter (10) together with the two stem connector clamps (7) to the plug stem (6).
3. Place actuator on yoke (9) and fasten tight using hex nut (5).
4. Pull adapter up to reach the actuator stem. Position the two stem connector parts (11) and fasten tight.

Types 5857, 5824, 5825, 3374, 5757-7, 5725-7, 2780, 3372 and 3271 (1000 and 1400 cm²) Actuators are mounted according to the mounting and operating instructions of the actuators and using the mounting parts listed in Table 8, if applicable.

Table 8: Required mounting parts

Type ... Actuator	DN 15 to 25	DN 32 to 50	DN 65, 80	DN 100 to 150	DN 200 to 300
5857	None	–	–	–	–
5824-10/-20	None		–	–	–
5824-30	–	–	Yoke 1400-7414	–	–
5825-10/-15/-20/-25	None		–	–	–
3374-10/11	–	–	None	None	–
3274-11/-15/-21/-22	–	–	Yoke 1890-8696	Yoke 1400-8822	–
3375-11	–	–	–	–	None
5757-7	None	–	–	–	–
5724-710/-715/ 5724-720/-725	None		–	–	–
3372	–	–	None	–	–
2780-1/-2	None		–	–	–
3372	None		–	–	–
3271, 240 cm ²	–	–	Yoke 1890-8696 and nut 0250-1450	–	–
3271, 350 cm ²	–	–	Yoke 1890-8696	–	–
3271, 700 cm ²	–	–	–	Yoke 1400-8822	–
3271, 1000/1400 cm ²	–	–	–	–	None
3277, 240 cm ²	–	–	Yoke 1890-8696	–	–
3277, 350 cm ²	–	–	Yoke 1890-8696	–	–
3277, 700 cm ²	–	–	–	Yoke 1400-8822	–

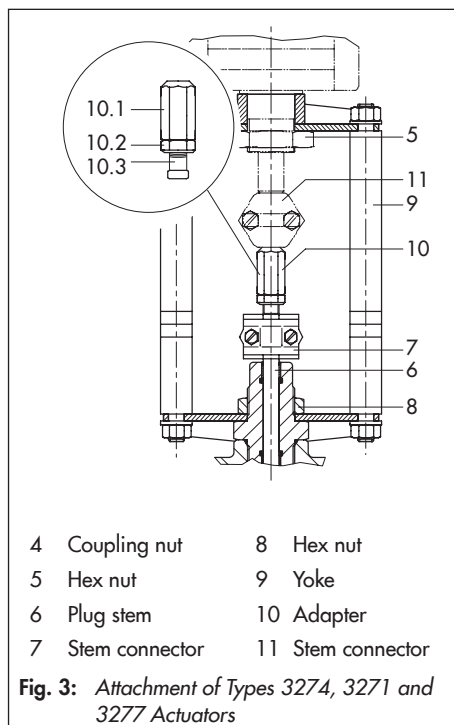
Mounting Type 3271 (240 to 700 cm²) and Type 3277 Actuators (Fig. 3)

1. Place yoke (9) on valve and fasten tight with hex nut (min. 100 Nm).
2. Type 3271 Actuator, 350/700 cm²
Type 3277 Actuator, 240/350/700 cm²:

- Fasten adapter (10) together with the two stem connector clamps (7) to the plug stem (6).

Type 3271 Actuator, 240 cm²:

- Replace the top adapter nut (10.1) on the adapter with nut (0250-1450).
 - Fasten new adapter (refastened together) with the two stem connector clamps (7) to the plug stem (6).
3. For actuators with fail-safe action "Actuator stem extends", apply air pressure slightly higher than the final value of the bench range to the loading pressure connection.
 4. Place actuator on yoke (9) and fasten tight using hex nut (5).
 5. Position the two stem connector parts (11) and fasten tight.



5.1 Connection

Perform the electrical or pneumatic connection of the actuator as described in the corresponding mounting and operating instructions.

5.2 Configuration

The electric actuator versions with positioner and the electric actuators with process controllers can be adapted to the control task. Configure the actuator as described in the corresponding mounting and operating instructions.

6 Dimensions and weights

Table 9: Type 3260 Three-way Valve

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300
Length L1	mm	130	150	160	180	200	230	290	310	350	400	480	600	850
Length L2	mm	70	80	85	100	105	120	130	140	150	200	210	450	550
Height H	mm	51	51	51	61	61	61	71	71	112	112	112	–	–
Height H2	mm	168	168	168	178	178	178	265	265	306	306	306	519	556
Weight approx. kg		4.0	5.0	5.5	8.5	10	12	20	23	38	50	65	266	410

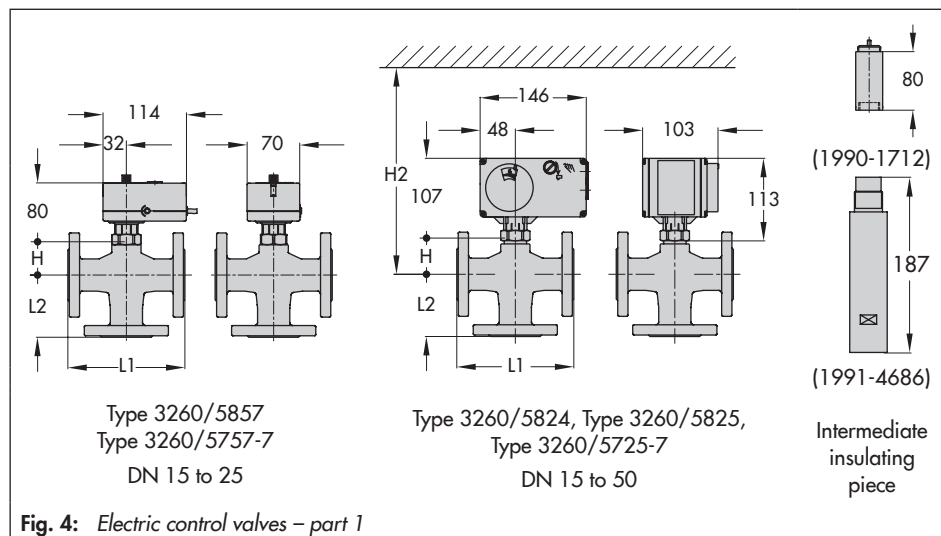
Table 10: Electric actuators

Type	5857	5824	5825	3374	3274	3375
Weight kg (approx.)	0.7	0.75	1.0	3.2	¹⁾	14.5

¹⁾ Types 3274-11/-21/-22: 12 kg · Type 3274-15: 15 kg

Table 11: Electric actuators with process controllers

Type	5757-7	5725-7
Weight kg (approx.)	0.7	1.3


Fig. 4: Electric control valves – part 1

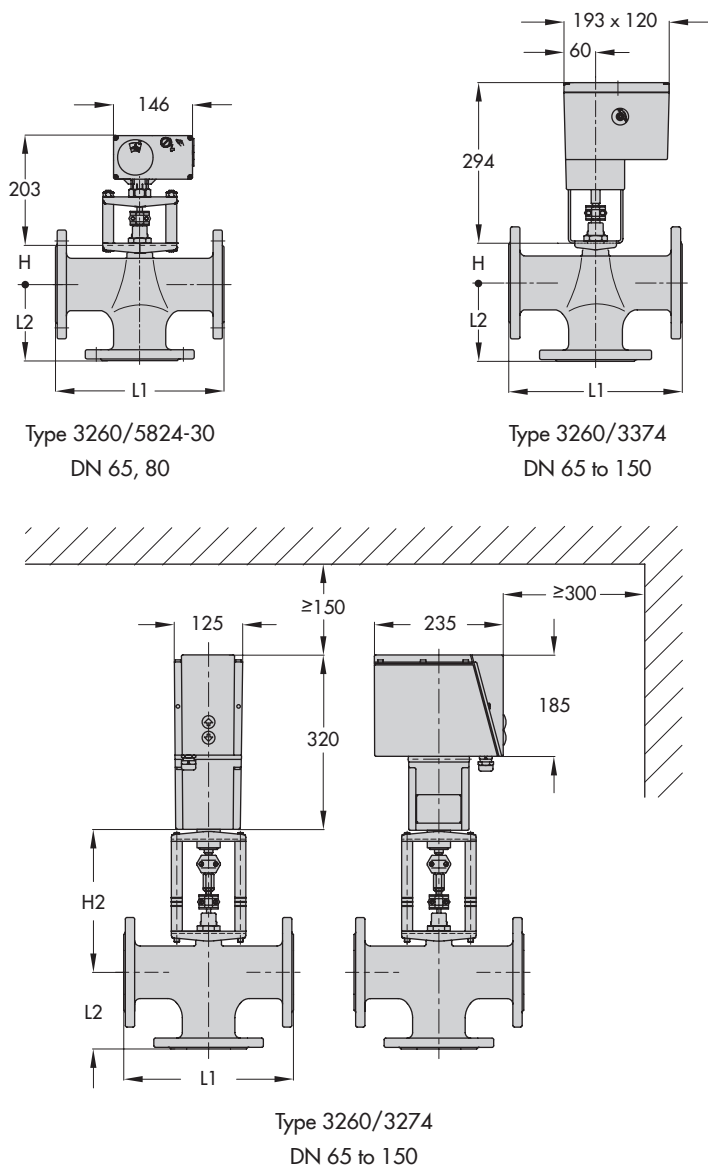
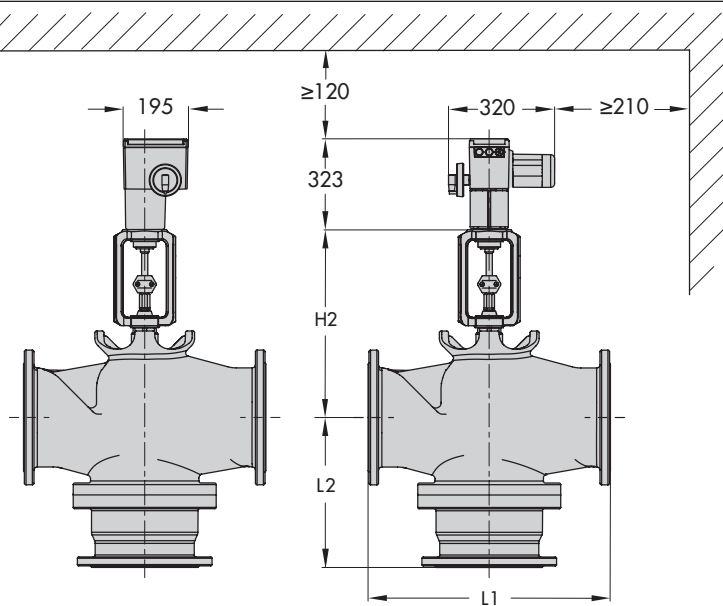


Fig. 5: Electric control valves – part 2



Type 3260/3375 · DN 200 to 300

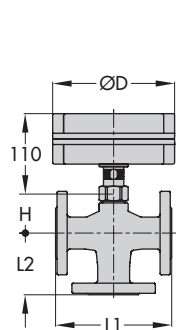
Fig. 6: Electric control valves – part 3

Table 12: *Type 3260 Three-way Valve*

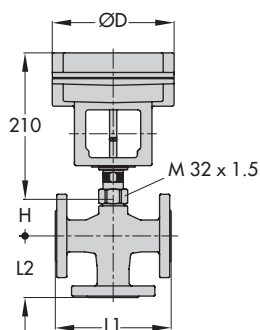
Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300
Length L1	mm	130	150	160	180	200	230	290	310	350	400	480	600	730	850
Length L2	mm	70	80	85	100	105	120	130	140	150	200	210	450	450	550
Height H	mm	51	51	51	61	61	61	71	71	112	112	112	–	–	–
Height H2	mm	168	168	168	178	178	178	265	265	306	306	306	519	519	556
Weight approx.	kg	4.0	5.0	5.5	8.5	10	12	20	23	38	50	65	266	285	410

Table 13: *Pneumatic Actuator*

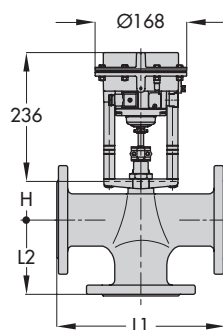
Type	2780	3372	3271					3277			
Effective area	cm ²	120	120	240	350	700	100	1400-60	240	350	700
Height H1	mm	–	–	65	80	199	267	380	65	65	199
Diaphragm D	mm	170	168	240	280	390	462	534	240	240	390
Loading pressure connection a		G 1/8	G 3/8	G 1/4	G 3/8	G 3/8	G 3/4	G 1	G 1/4	G 3/8	G 3/8
Weight	kg (approx.)	2	3.7	5	8	22	80	175	9	12	26



Type 3260/2780-1
DN 15 to 50

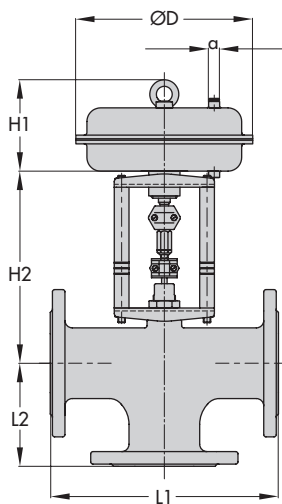


Type 3260/2780-2
DN 15 to 50

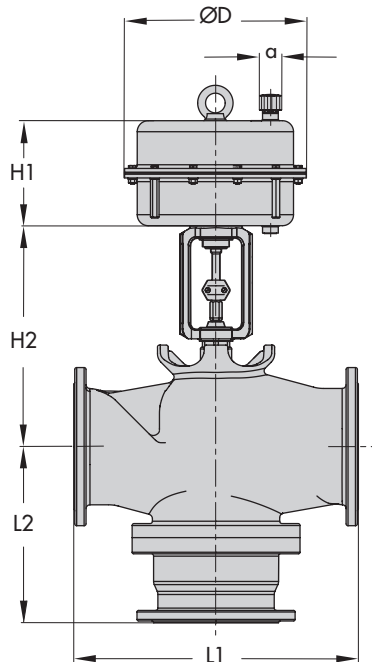


Type 3260/3372
DN 65, 80

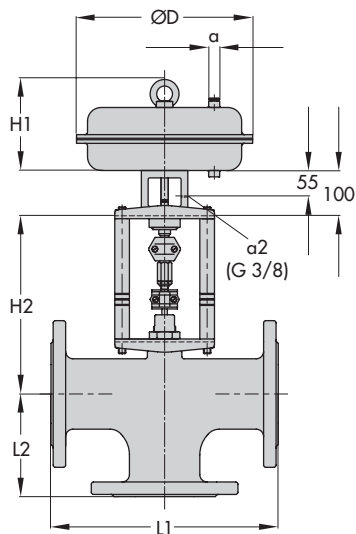
Fig. 7: *Pneumatic control valves – part 1*



Type 3260-1 · DN 65 to 150



Type 3260-1 · DN 200 to 300



Type 3260-7 · DN 65 to 150

Fig. 8: Pneumatic control valves – part 2



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